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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/656,246

09/08/2003

Tadashi Nomura

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05/09/2005

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EXAMINER

TAKAOKA, DEAN O

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 05/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/656,246

Applicant(s)

NOMURA ET AL.

Examiner

Dean O. Takaoka

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 16-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17-30 is/are allowed.
- 6) ☒ Claim(s) 1, 8, 9 and 16 is/are rejected.
- 7) ☒ Claim(s) 2-7 and 10-14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 8, 9 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Kaitila et al. (U.S. Patent No. 6,788,170).

Claim 1:

Kaitila et al. (structure 800 in Fig. 8a) shows a piezoelectric resonator comprising a substrate (200) having one opening (col. 8, lines 41-43) and a concavity (e.g. angled cavity 210); a vibrating section (802; where 802 defines the center area – col. 7, lines 54,55; the center area further defined as the electrically excitable area – col. 5, lines 9-11) in which at least one pair of an upper electrode (120) and a lower electrode (110) oppose each other so as to sandwich an upper surface and a lower surface of a thin-film section having at least one layer of a piezoelectric thin film (100 and col. 1, line 65),

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the vibrating section being disposed over the one of the opening and the concavity; and a heat dissipating film (801 – col. 7, lines 54-59; where damping layer 801 is a film – col. 7, lines 26-31; damps Q where a small Q refers to large energy losses caused by vibrational losses due to heat – col. 6, lines 49-54, thus the damping layer being a heat dissipating film) located over at least one of the upper electrode and the thin-film section so as not to cover the vibrating section (802).

Claim 8:

Where the vibrating section (802) has a polygonal shape (i.e. rectangular) with edges of different lengths as viewed in a thickness direction (top view), and at least the longest edge (either length) extends along an edge of the one of the opening and the concavity (where the distance from the lengthwise edge of the vibrating section to the edge of the concavity is broad and not defined by the claim, thus where Kaitila et al. also shows where both edges are in a parallel orientation).

Claim 9:

Where the longest edge of the vibrating section (802) has a length that is longer than a distance between the one of the opening and the concavity and a point of the vibrating section that is most distant from the edge of the one opening and the concavity (where Kaitila et al. shows a rectangular vibrating section 802 where the length of the vibrating section would be longer than any edge of the vibrating section with respect to the cavity, shown in the top and planar views in Fig. 8a).

Claim 16:

Where the longest edge of the vibrating section (802) has a length that is longer than a distance between the one of the opening and the concavity and a point of the vibrating section that is most distant from the edge of the one opening and the concavity (discussed in the reasons for rejection of claim 9 above).

Response to Arguments

Applicant's arguments filed March 17, 2005 have been fully considered but they are not persuasive.

Claims 1, 8, 9 and 16 rejected under 35 U.S.C. 102(e) as being anticipated by Kaitila et al.

The Applicant directs attention to the limitation of claim 1 where "*a heat dissipating film located over at least one of the upper electrode and the thin-film section so as not to cover the vibrating section.*" (emphasis added) where the Applicant asserts Kaitila et al. does not show or teach this feature. The Applicant asserts Kaitila et al. provides a frame member (801) which only dampens the vibration of the piezoelectric material and "*provides absolutely no heat dissipation function*". The Applicant further asserts the frame member of Kaitila et al. covers at least a portion of the vibrating section defined as 100, thus the frame member 801 is "*clearly not located so as not to cover the vibrating section.*" Where the Examiner disagrees to Applicant's arguments.

It is the position of the Examiner that Kaitila et al. teaches a heat dissipating film where the frame member (801) dampens the vibration of the piezoelectric material and provides a heat dissipation function. The frame member 801 is made, as an example, of a lossy film material such as a polymer film (col. 7, lines 26-30). Kaitila et al. also

teaches where acoustical dampening of the various regions of the resonator structure is accounted for defined by Q or quality factor (col. 6, lines 45-49). Kaitila et al. further teaches where a large quality factor refers to small energy losses caused by the transformation of vibrational energy into heat, thus a small Q refers to large energy losses (col. 6, lines 49-52). Since the dampening frame member of Kaitila et al. provides a dampening of Q at the edges (col. 6, lines 53-56), the frame member 801 thus provides heat dissipation by lowering Q at the edges thus providing large energy losses (i.e. transformation of vibrational energy into heat).

Kaitila et al. also shows the heat dissipating film located over at least one of the upper electrode and the thin-film section so as not to cover the vibrating section where Kaitila et al. further teaches an alternative embodiment shown in Fig. 8c where the frame member encircles the piezoelectrically excitable area, thus teaching the limitations of claim 1, thus the rejection of the claims above are maintained.

Allowable Subject Matter

Claims 17 – 30 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 17, previously objected to in the Office action dated December 13, 2004, has incorporated the subject matter of independent claim 15 and is now in condition for allowance.

Kaitila et al. shows the piezoelectric resonator comprising a substrate having an opening and a concavity where the upper and lower electrodes oppose each other so

as to sandwich an upper and lower surface of a thin-film section having at least one layer of piezoelectric thin film, the vibrating section viewed in a thickness direction having a polygonal shape with edges of different lengths and at least the longest edge of the vibrating section extending along an edge of the opening and the concavity but does not teach or suggest where the distance between the longest edge of the vibrating section and the edge of the opening and concavity is approximately one half of a vibrating wavelength of the vibrating section where Kailtila et al. does not show any dimensional lengths of the vibrating section much less provide wavelength relationships but merely teaches Q response nor would it obvious to combine any of the prior art to teach this function, thus the claims above are in condition for allowance.

Claims 2 – 7 and 10 – 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean O. Takaoka whose telephone number is (571) 272-1772. The examiner can normally be reached on 8:30a - 5:00p Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sam Krawiec

dot
May 5, 2005